

## **C. Raptor Nesting & Migration Monitoring Protocol**



**COTTEREL MOUNTAIN RAPTOR NESTING AND  
MIGRATION MONITORING PROTOCOL**



Photo courtesy of Tim Reynolds

June 28, 2006



## **1.0 INTRODUCTION**

The primary goal of this study is to collect annual information that will be used to help evaluate the impacts of the Cotterel Mountain wind energy facility on nesting and migrating raptor species in the region. Objectives of the raptor nest studies will be to evaluate numbers and distribution of nesting raptors that may be potentially influenced by the project, and to evaluate potential effects of wind turbines and other project features on nesting success.

Cotterel Mountain is somewhat unique in both location and height; because of these unique features, some local biologists believe that Cotterel Mountain acts as a leading line and serves as a significant passageway for birds during fall migration. Fall migration surveys will be conducted in an effort to better understand local raptor migration patterns, and determine the level of potential impact that could result from the addition of a wind power facility on Cotterel Mountain. The objectives this raptor migration study will be to identify any general annual changes occurring in the number of raptors observed migrating, changes in species composition, or flight paths used by raptors observed migrating through the Cotterel Mountain project area.

## **2.0 EXISTING BASELINE STUDIES FOR COTTEREL MOUNTAIN**

### **NESTING SURVEYS**

Raptor nest surveys were conducted during May and June of 2003 on Cotterel Mountain (TREC 2004). During the survey flights 41 nests were recorded. Excluding corvids and ground nesting-species, there were 21 active and 20 inactive raptor nests. 13 sightings of birds of prey initially not associated with nests were recorded. The behavior of some of these birds suggested they were hunting or loafing, while others exhibited territorial behavior. Nests for some of these territorial birds were ultimately located during the second survey. Two groups of owl fledglings (Short-eared Owl and Great-horned Owl) were recorded. A pair of Barn-Owls loafing near a suspected cliff nest site was also recorded. Twenty raptor nests were inactive, and ranged in condition from relatively sturdy and fresh looking to dilapidated and derelict.

Survey efforts encompassed approximately 68 square miles. The density of known active nests for large raptors on Cotterel Mountain during 2003 was approximately 0.32 nests/mi<sup>2</sup>. Raptor nesting density at other wind project sites in Oregon, Washington, Colorado, Wyoming, and Minnesota ranged from 0.03 – 0.30 nests/mi<sup>2</sup>, with a median density of 0.16 nests/mi<sup>2</sup> (n = 28; Burt, In Litt. 2004). Reasons for slightly higher densities are likely due to the diversity of habitats on Cotterel Mountain, plus ample relatively inaccessible cliffs with suitable nest platforms.

## **MIGRATION SURVEYS**

On August 21, 2003, biologists from URS and TREC identified and established a series of migration survey points on Cotterel Mountain. Points were selected mostly for their panoramic view of the ridgeline and, based on the biologists' opinions, vantage of likely migration corridors. A total of 1,299 observations of 14 species of birds of prey were recorded. Results of the 2003 fall migration survey at Cotterel Mountain suggests it to be a significant course for fall raptor migration (TREC 2003) when compared to other western-states raptor migration monitoring stations (TREC 2003, HawkWatch Intl. 2003).

## **3.0 METHODS**

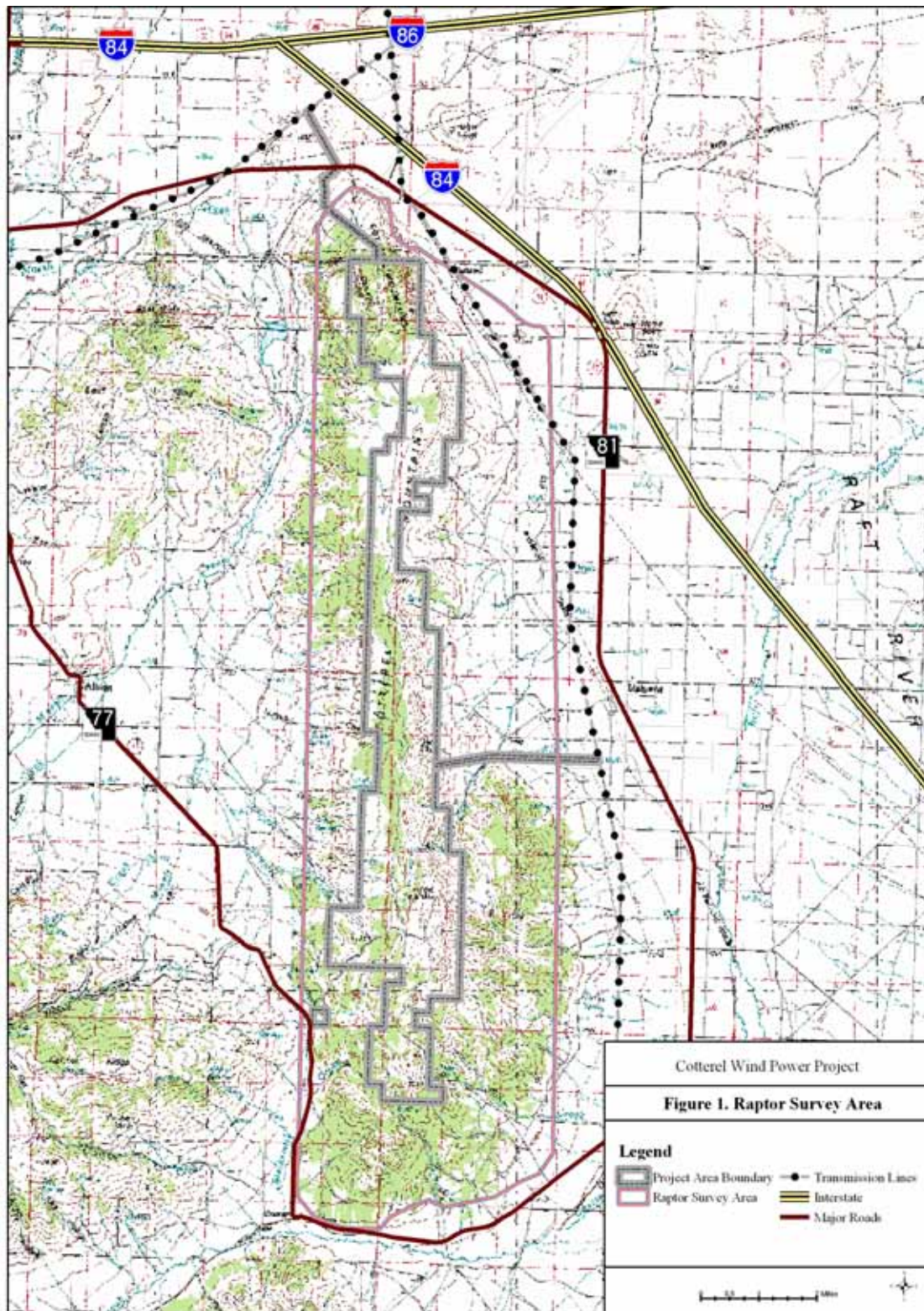
### **NESTING SURVEYS**

Nesting surveys will focus on key habitat features for raptor species of primary interest, including, but not limited to, golden eagle (*Aquila chrysaetos*) and ferruginous hawk (*Buteo regalis*). However, the entire project area and buffer will be completely surveyed each year.

Helicopter surveys to locate active raptor nests will be conducted within a two-mile buffer surrounding the outmost edge of the turbine strings (Figure 1). A second helicopter survey will be conducted approximately 29 days later to determine nest success and activity of later season nesters, such as Swainson's hawks (*Buteo swainsoni*).

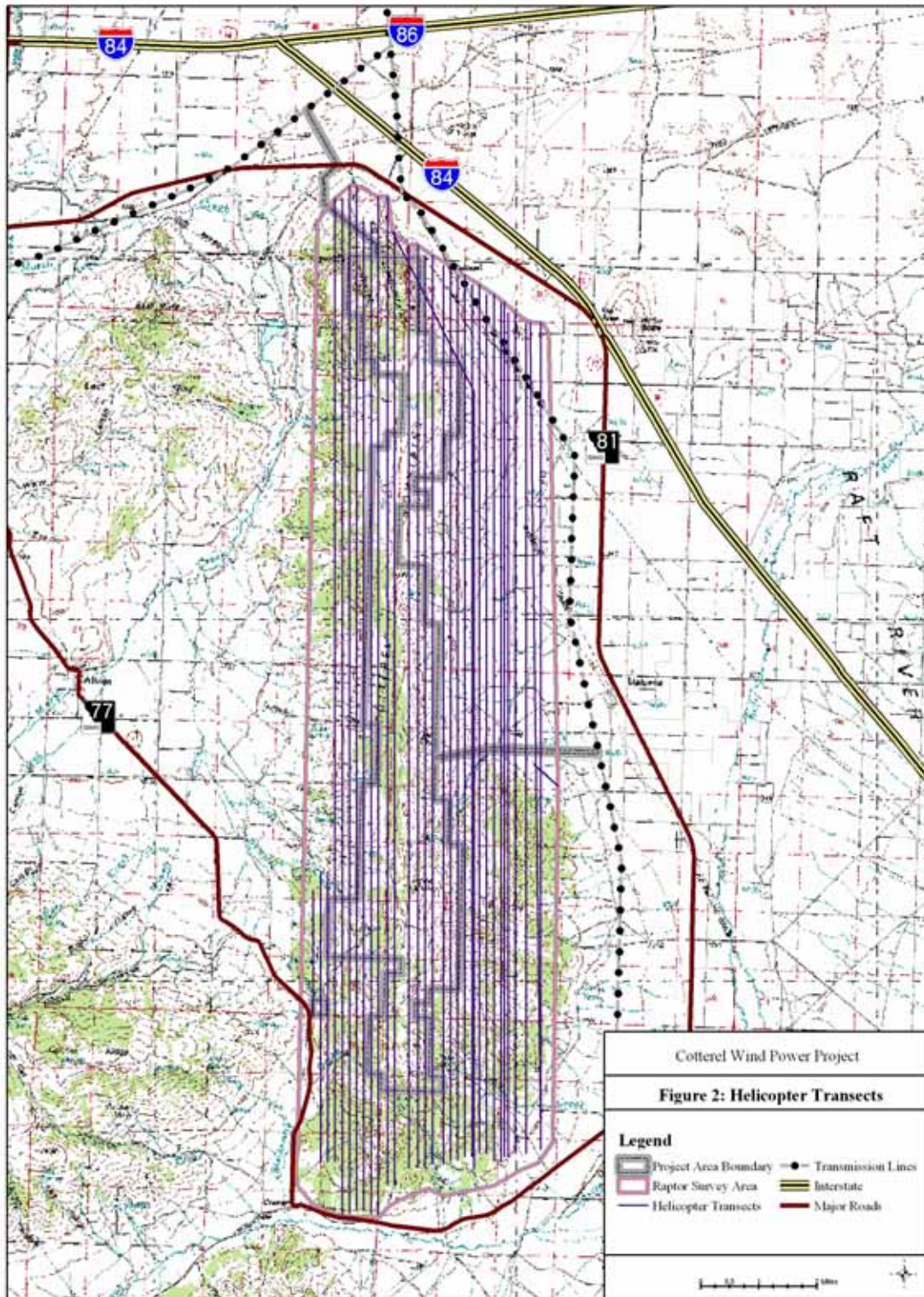
A minimum of two aerial helicopter surveys will be completed to locate and map nest sites, as well as to gather nest success data. Approximately 31 north-south transects will be flown during the survey effort (Figure 2). Locations of inactive nests will also be recorded as they may be occupied during subsequent years. All nests, whether active or inactive, will be given a unique identification number, and locations will be recorded using a Global Positioning System (GPS). When possible, the behavior (territorial defense, hunting, roosting, etc.) of nesting raptors will be recorded. The nest type (platform, scrape, other) and nest material will also be recorded when possible (Harrison, 1979).

North-south transects will be flown at 655 foot intervals at approximately 100 feet above ground level. The starting point of the aerial survey will be approximately two miles east and south of the southernmost project feature, moving each subsequent transect to the west. Key raptor habitat features, as well as previously recorded data (TREC 2004) will be utilized to determine approximate flight paths in an effort to maximize efficiency and time. Flight paths on the west slope of Cotterel Mountain will be determined by topography; when surveyors come upon the head of a canyon, the flight path will transition to east-west, traversing along both rims of every canyon. In an effort to be more efficient, the second survey (approximately 29 days later) will be flown in a serpentine pattern, concentrating on cliffs, sparse juniper habitat, other likely raptor nesting areas, and locations of nests observed during the initial survey flights (TREC 2004).



**Figure 1.** Raptor Survey Area.





**Figure 2.** Typical Raptor Nest Survey Helicopter Transect Flight Path.



## **MIGRATION SURVEYS**

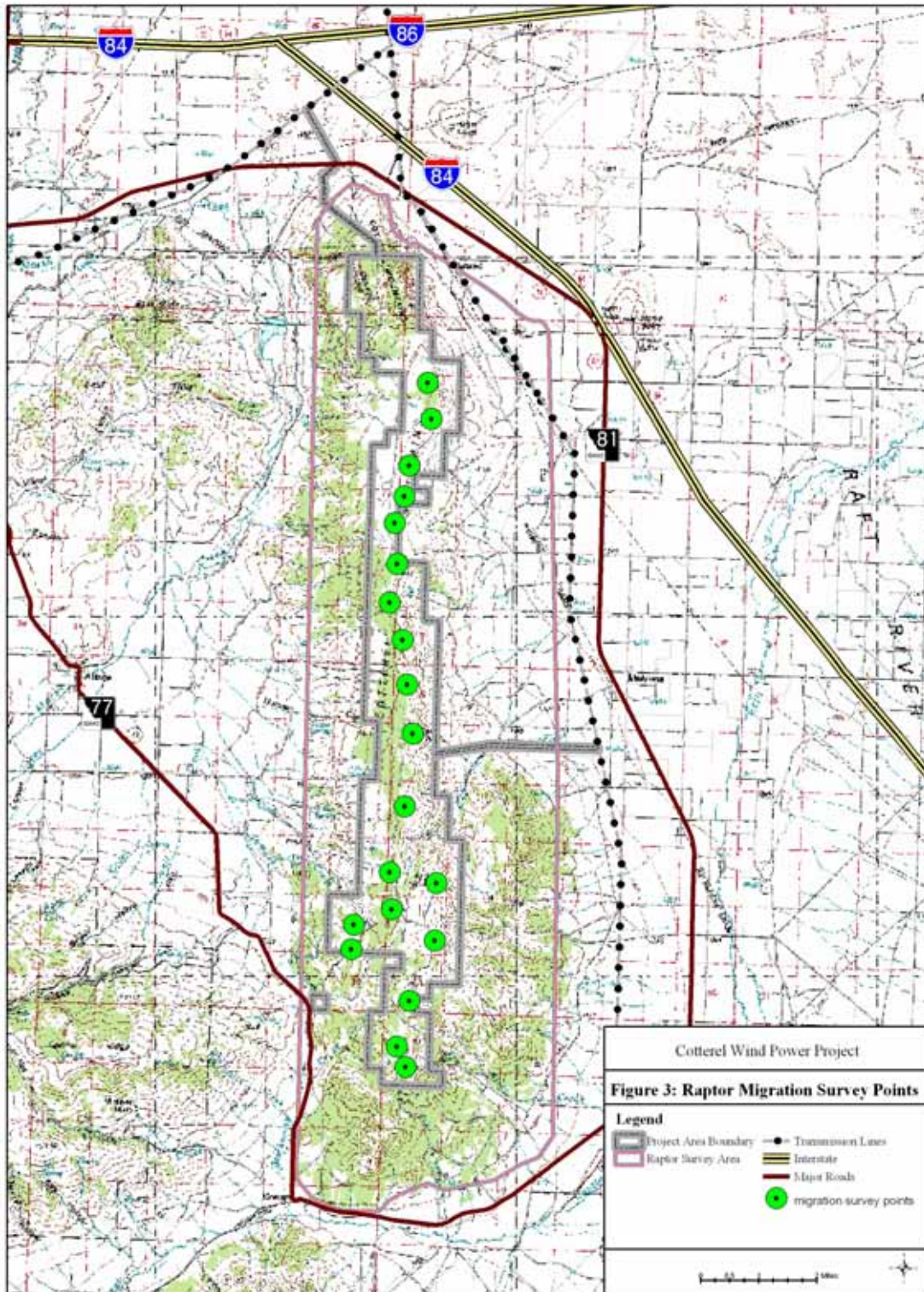
Annual migration surveys will utilize the existing 18 established migration survey points (Figure 3). Survey locations may need to be adjusted or moved due to the creation of new access roads and turbine locations. Project biologists will use best professional judgment, in combination with Idaho Department of Fish and Game feedback, when establishing long-term migration survey points. Surveys will begin generally in late August and continue through late October. Data will be collected following the established protocol (Appendix A), and be recorded on standardized field data sheets (Appendix B). Surveys will be conducted six days a week (Monday through Saturday), starting at 1000 and ending at 1800 each survey-day. To reduce bias related to observer fatigue or time of day, the start point for each survey cycle will be randomized (one complete round of all 18 survey stations). Observation bouts will be 30 minutes at each station, during which time the observer will make six 360° sweeps with binoculars at approximately 5 minute intervals. Flight paths will be drawn on individual topographic maps for each survey station and surrounding environs. To help estimate distances accurately, field personnel will have a laser range finder at their disposal, and visible markers will be placed at known distances from each survey point.

## **4.0 MONITORING TIMELINE**

Raptor nesting and migration monitoring will be initiated within two weeks of the start of project operation. The annual monitoring will continue for a period of five years. At the end of the fifth year the monitoring effort will be evaluated to determine if additional monitoring should continue in an effort to provide useful information regarding the impact of wind power on raptor species at Cotterel Mountain.

## **5.0 REPORTING REQUIREMENTS**

Results regarding each year of raptor nesting and migration monitoring will be summarized in an annual report. This report will include the complete data set for all monitoring collected since the beginning of the facility operation. The report will be submitted to the BLM Burley Field Office by January 15<sup>th</sup> of each year.



**Figure 3.** Raptor Migration Survey Points.

## **6.0 LITERATURE CITED**

- Burt, A. 2004. Unpublished data on raptor nest densities at project sites in Oregon, Washington, Colorado, Wyoming, and Minnesota. E-mail to T. Reynolds 1-19-04 Maul Foster Alongi, Incorporated, Portland, Oregon.
- Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. *The Birder's Handbook: A field guide to the natural history of North American Birds*. Simon & Schuster Inc., New York. 785 pp.
- Harrison, H. H. 1979. *A field guide to western bird's nests*. Houghton Mifflin Co., Boston. 279 pp.
- HawkWatch International. 2003. Utilized organization website, found at [www.hawkwatch.org](http://www.hawkwatch.org).
- TREC. 2003. 2003 Fall Avian Migration Survey for the Cotterel Mountain Wind Project. 32pp.
- TREC. 2004. A Survey of Nesting Raptors for the Proposed Cotterel Wind Power Project. 11 pp.

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## **APPENDIX A**

### **Avian Migration Survey Protocol**



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## **Avian Migration Survey Protocol Cotterel Mountain Wind Project**

- Avian Migration Surveys (AMS) will be conducted from 18 pre-determined locations (Stations) along the three proposed primary wind turbine strings on Cotterel Mountain.
- AMS will be conducted from 1000 – 1800 hours, daily except Sunday.
- AMS will be conducted for 30 minutes at each station.
- During the 30 minute survey period, the observer will make six 360<sup>0</sup> sweeps with binoculars at 5 minute intervals.
- Stations will be visited in a random order to avoid time-of-day and observer-fatigue bias.
- All birds observed will be recorded on the data sheets.
- Flight paths of all individual raptors and flocks (> 5 individuals) of other birds will be sketched on the data sheet regardless of distance from the observer (there is no “count circle”).
- Data Sheet
  1. Observation Number: Used to map flight paths
  2. Time of day (24 hr clock)
  3. Species: Standard AUO alphanumeric abbreviations
  4. Sex (if determinable, otherwise “?”)
  5. Age (A = adult; HY = hatch year; AHY = after hatch year)
  6. Number of individuals
  7. Distance (in meters): from observer when first observed and when closest to observer
  8. Activity:
    - PE = Perched
    - SO = Soaring
    - FL = Flapping Flight
    - CS = Circle Soaring
    - HU = Hunting
    - OT = Other (explain in comment section)
  9. Migrant ? In your opinion is this a migrating bird/flock? Y = Yes, N = No.
  10. Height (in meters) when first observed, lowest, and highest.
  11. Flight direction (16 point cardinal direction; N, NNE, ENE, E, ESE, etc.)
  12. Check any and all of the six binocular sweeps in which the bird(s) was (were) observed.
  13. Add any additional comments.

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**APPENDIX B**

**Avian Migration Observer Data Sheet**

**and**

**In Transit and Incidental Observation Form**

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### Cotterel Mountain Wind Project

#### AVIAN MIGRATION OBSERVATION DATA SHEET

DATE (mmddyy) \_\_\_\_\_ OBSERVER \_\_\_\_\_ START TIME \_\_\_\_\_ END TIME \_\_\_\_\_ Station \_\_\_\_\_  
 WEATHER: VISIBILITY (circle one) good fair poor CLOUD COVER (%) \_\_\_\_\_ TEMP \_\_\_\_\_ (°C) (°F) (circle one)  
 WIND: DIRECTION (circle one) N NE E SE S SW W NW n/a SPEED Low: \_\_\_\_\_ High: \_\_\_\_\_ (kph) (mph) (circle one) Page \_\_\_ of \_\_\_  
 PRECIPITATION (circle one) none (n) light rain (lr) rain (r) light snow (ls) snow (sn) sleet (sl) hail (h) other (o), describe in comments \_\_\_\_\_

Obs. No.	Time (24 hr clock)	Species or best possible ID	Sex	Age	No. of ind.	Dist.(m) from obs. 1st/closest	Activity			Mig rant?	Flight Height (meters)			Flight Dir. (to)	Sweep number						Comments
							PE	SO	FL		CS	HU	OT		1st	low	high	1	2	3	
1																					
2																					
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9																					
10																					
11																					

## COTTEREL MOUNTAIN PROJECT FALL MIGRATION INTRANSIT AND INCIDENTAL DATA FORM

DATE \_\_\_\_\_ OBS \_\_\_\_\_ START TIME \_\_\_\_\_ END TIME \_\_\_\_\_ OBSERVER \_\_\_\_\_ DATA FORM ID \_\_\_\_\_

COMMENTS ON WEATHER OR OTHER NOTABLE CONDITIONS/CHANGES:

[illegible]